Government of Pakistan

National Vocational and Technical Training Commission

Blended International IT Trainings – BIITT 2025

Course Contents/ Lesson Plan

Course Title: IBM Full-Stack JavaScript Developer Professional Certificate

Duration: 3 Months

NAVTTC HQs, Plot no. 38, Kirthar Road, H-9
Islamabad

Trainer Name	
Course Title	**IBM Full-Stack JavaScript Developer Professional Certificate**
Objective of Course	A full-stack JavaScript developer is responsible for both the front-end (client-side) and back-end (server side) development of web applications. In this program, you'll learn to build, deploy, test, run, and manage cloud-native full-stack applications. Technologies covered include **HTML, CSS, GitHub, JavaScript, Node.js, Express, React, DevOps, Containers, Docker, Kubernetes, NoSQL databases, Microservices, Serverless computing**, and more. You'll also **develop several applications using front-end and back-end technologies** and deploy them using cloud-native methodologies. In the final course, you learn inside tips and steps to perform effectively at interviews and **unlock exclusive access to career support resources** to help you in your job search. Upon completing the full program, you will have a portfolio of projects that will not only boost your confidence but also prepare you to excel in interviews. Additionally, you will be awarded a Professional Certificate and a badge from IBM, serving as tangible proof of your skills and proficiency to potential employers.
Course Execution Plan	Total Duration of Course: **3 Months (12 Weeks)**
	Class Hours: **3 Hours per day**
	Theory: 30% Practical: 70%
	Weekly Hours: **15 Hours Per week**
	Total Contact Hours: **200 Hours**

Learning Outcome of the Course	By the end of the course, students will have acquired a comprehensive skill set in: • Master the full-stack development languages, frameworks, tools, and technologies to develop job-ready skills valued by employers. • Develop websites and front-end software using HTML, CSS, JavaScript, and React. • Write, deploy, and scale cloud-native back-end applications using Node, NoSQL databases, containers, microservices, and serverless. • Employ DevOps practices and Agile methodologies to continuously build and deploy software using CI/CD tools.
Companies Offering Jobs in the respective trade	• IBM • Accenture • Cognizant • Infosys • Capgemini • Amazon • Flipkart • Turing • Andela • Deel • Freelancing These companies, Hands-on, project-based learning, end-to-end understanding of frontend, backend & deployment and proven skills in modern JavaScript tools & frameworks.
Job Opportunities	Over the past decade, JavaScript has evolved into the backbone of modern web development, powering everything from single-page applications to enterprise-level platforms. With the rapid shift toward cloud-based and responsive digital solutions, full-stack JavaScript developers are in high demand across industries. Graduates of this certification can pursue roles such as: • Full-Stack JavaScript Developer • Frontend Developer (React.js) • Backend Developer (Node.js, Express) • Web Developer • Junior Software Engineer • MERN Stack Developer • API Developer • DevOps Support Engineer • Technical Support Engineer (Web Stack) • Freelance Web Developer • Cloud Web Application Developer • Deployment Engineer (CI/CD)
No of Students	25-30

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Learning Place	Labs
Instructional Resources	The following link will be accessible for students once they are enrolled in the program: https://www.coursera.org/professional-certificates/ibm-full-stack-javascript-developer

Scheme of Study

Sr. No	Main Topics	Theory Hrs.	Practical Hrs.	Total Hrs.
1.	Introduction to Software Engineering	12	3	15
2.	Introduction to Software Engineering / Introduction to HTML, CSS, & JavaScript	7	8	15
3.	Getting Started with Git and GitHub / JavaScript Programming Essentials	4	11	15
4.	JavaScript Programming Essentials / Developing Front-End Apps with React	4	11	15
5.	Developing Front-End Apps with React / Developing Back-End Apps with Node.js and Express	4	11	15
6.	Developing Back-End Apps with Node.js and Express / Get Started with Cloud Native, DevOps, Agile, and NoSQL	4	11	15
7.	Get Started with Cloud Native, DevOps, Agile, and NoSQL / Introduction to Containers w/ Docker, Kubernetes & OpenShift	3	12	15
8.	Introduction to Containers w/ Docker, Kubernetes & OpenShift / Application Development using Microservices and Serverless	4	11	15
9.	Application Development using Microservices and Serverless / Node.js & MongoDB: Developing Back-end Database Applications	4	11	15
10.	Node.js & MongoDB: Developing Back-end Database Applications	3	12	15
11.	Node.js & MongoDB: Developing Back-end Database Applications / JavaScript Full Stack Capstone Project	2	13	15
12.	JavaScript Full Stack Capstone Project / Software Developer Career Guide and Interview Preparation	3	12	15
	Total	**54**	**126**	**180**

Scheduled Week	Module Title	Day	Learning Units	Tasks
Week 1/12	Introduction to Software	Day 1	The Software Development Lifecycle	Create an Architectural Diagram
		Day 2	Introduction to Software Development	

	Engineering	Day 3	Basics of Programming	
		Day 4	Software Architecture, Design, and Patterns	
		Day 5	Job Opportunities and Skillsets in Software Engineering	
Week 2/12	Introduction to Software Engineering / Introduction to HTML, CSS, & JavaScript	Day 1	Quiz and Final Project	Simple Interest Calculator
		Day 2	HTML Overview	
		Day 3	CSS Overview & HTML5 Elements	
		Day 4	JavaScript Programming for Web Applications	
		Day 5	Career Opportunities and Final Project	
Week 3/12	Getting Started with Git and GitHub / JavaScript Programming Essentials	Day 1	Git and GitHub Fundamentals	Cloning and Forking GitHub Projects
		Day 2	Git Commands and Managing GitHub Projects	
		Day 3	Project and Assessment	
		Day 4	Working with GitHub from Your Windows Desktop	
		Day 5	Introduction to JavaScript Development	
Week 4/12	JavaScript Programming Essentials / Developing Front-End Apps with React	Day 1	Arrays and Objects in JavaScript	Develop an Application for Healthcare Census
		Day 2	Working with DOM in JavaScript	
		Day 3	JavaScript Async	
		Day 4	Final Project and Course Wrap-up	
		Day 5	Introduction to React and Class Components	
Week 5/12	Developing Front-End Apps with React / Developing Back-End Apps with Node.js and Express	Day 1	Understanding Function Components with Array and DOM Manipulation	Async Callback Programing
		Day 2	In-depth Understanding of Advanced React Functionality	
		Day 3	Practice, Final Project, and Peer Review Assignment	
		Day 4	Introduction to Server-Side JavaScript	
		Day 5	Asynchronous I/O with callback programming	
Week 6/12	Developing Back-End Apps with Node.js and Express / Get Started with Cloud Native, DevOps, Agile, and NoSQL	Day 1	Express Web Application Framework	Friends List Application Using Express Server with JWT
		Day 2	Final Project	
		Day 3	Introduction to Cloud Native	
		Day 4	DevOps & CI/CD	
		Day 5	Agile & Scrum	
Week 7/12	Get Started with Cloud Native, DevOps, Agile, and NoSQL / Introduction to Containers w/ Docker, Kubernetes & OpenShift	Day 1	NoSQL Databases in Cloud	Tax Calculator application
		Day 2	Final Project and Final Exam	
		Day 3	Containers and Containerization	
		Day 4	Kubernetes Basics	
		Day 5	Managing Applications with Kubernetes	
Week 8/12	Introduction to Containers w/	Day 1	The Kubernetes Ecosystem: OpenShift, Istio, etc.	Build and Deploy a Simple Guestbook

	Docker, Kubernetes & OpenShift / Application Development using Microservices and Serverless	Day 2	Final Assignment	App
		Day 3	Final Assignment	
		Day 4	Introduction to Microservices	
		Day 5	Web API Essentials: REST API and GraphQL	
Week 9/12	Application Development using Microservices and Serverless / Node.js & MongoDB: Developing Back-end Database Applications	Day 1	Serverless Overview	Product Price Comparison Application
		Day 2	Create and Deploy Microservices using Serverless	
		Day 3	Final Project	
		Day 4	OpenShift Essentials/Working with OpenShift and Istio	
		Day 5	Introduction to Working with Databases	
Week 10/12	Node.js & MongoDB: Developing Back-end Database Applications	Day 1	Introduction to Working with Databases	Deploying a Dockerized Node App for Customer Portals
		Day 2	Working with Node and Databases	
		Day 3	Working with REST API's and advanced Node concepts	
		Day 4	Error Handling and Middleware	
		Day 5	Scaling and Deploying Node Applications	
Week 11/12	Node.js & MongoDB: Developing Back-end Database Applications / JavaScript Full Stack Capstone Project	Day 1	Final Project	Social Media Dashboard
		Day 2	Final Quiz, and Course Wrap-Up	
		Day 3	Project Introduction, Repository Setup, User Stories and Database Setup	
		Day 4	Back-end APIs and Services	
		Day 5	Add Front-end Pages	
Week 12/12	JavaScript Full Stack Capstone Project / Software Developer Career Guide and Interview Preparation	Day 1	Back-end APIs for Front-end Components	Capstone Project
		Day 2	CI/CD, Containerize, and Deploy	
		Day 3	Final Project Submission	
		Day 4	Building a Foundation	
		Day 5	Applying and Preparing for an Interview	

List of Machinery / Equipment

1. **Software List**

Sr. No	Software Name

1.	MS Office(Installed on each PC)
2.	Operating System (Windows, Linux or other Operating Systems)
3.	Programming Languages including JavaScript (Front-End & Back-End with Node.js), HTML5, CSS3, React.js, Express.js, MongoDB Query Language (MQL), JSON, Python, SQL

2. Minimum Qualification of Teachers / Instructor

The qualification of teachers / instructor of this course should be a minimum of bachelor's in computer science / software engineering with minimum 3 years of development experience in relevant trade.

3. Eligibility for the trainees:

As defined by NAVTTC

4. List of Machinery/Equipments

Sr. No	Name of item as per curriculum	Quantity physically available at the training location
1	Computers Minimum Core-i5 8th Generation ● LCD Display 17" with built in speakers	25
2	DSL Internet Connection (Minimum 5 MB)	Available on every PC
3	**Accessories/Devices** ● Connectors ● Multimedia ● Audio/visual aid ● White Board ● Flip Chart Board	25 each
4	**Wires, data cables, power plugs, power supply**	For every PC
5	**UPS**	Available
6	**Generator / Solar Backup**	Available
7	**Air Conditioner (2 Tons)**	Available